

Space Weather Forecast

Issued on Monday, 12 December 2022 at 01:11 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate-class X-ray flares throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with occasional low-level Common-class flares recorded. The largest of these flares was seen at 11/1140UTC from the vicinity of the largest sunspot group.

This was one of up to nine sunspot regions on the Sun, with the 24-hour period seeing up to three new developing bipolar regions. Some other recent noteworthy sunspot regions saw a quietening trend through the UTC day of Sunday. All other sunspot regions were either stable magnetic 'unipoles' or else simple dipoles.

A 'disappearing filament' (arc of plasma) was noted from the southeast of the Sun around 11/1200-1300UTC in extreme UV and ground-based near-infrared imagery, with a northeast solar horizon 'prominence' (arc of plasma on the Sun's edge) erupting at a similar time. Neither of these was obviously attributable to any Earth-directed Coronal Mass Ejections (CMEs) in imagery.

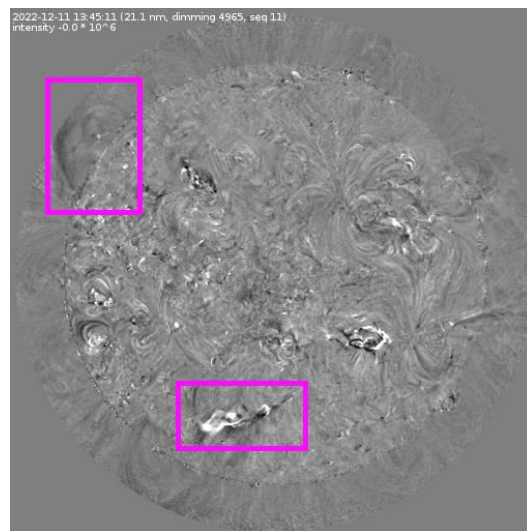


Figure 1: Time-integrated extreme UV image sequence around 11/1300UTC showing a potential disappearing filament (centre) and prominence eruption (upper left). Neither event has yet appeared in imagery used to assess CMEs. Image processing courtesy of SIDC ROB.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of the waning effects of a fast

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

wind, with the solar wind speed slightly elevated throughout, with a very slight decline noted. The number of particles in the solar wind showed a roughly level tendency near the long-term background, while their magnetic field was stable and small-scale throughout. The north-south component of the field showed no protracted aligned or anti-aligned periods (with Earth's field).

The net result of the above solar wind measures was for provisionally mainly quiet geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of isolated Moderate-class X-ray flares each day. Further arriving sunspot regions into the coming UTC working week may see a further slight increase in activity.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast.

There are up to two fast wind streams due in the four days, firstly the now declining high speed stream on day one, but also potentially a minor fast wind that may graze Earth later on day two, Tuesday 13 December. Muted effects are predicted from the latter by persistence. In addition, its current tenuous appearance and our proximity to the semi-annual minimum potency of coronal holes (around the solstices) all lend themselves to slight effects on geomagnetism if even present, else being quiet.

Energetic Particles / Solar Radiation: Solar radiation storms should remain near background levels throughout, with a daily slight chance of seeing S1+ levels if any significant flares were to occur.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	25	30	30	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)